20.2: Complex #'s

A complex number is any number that can be expressed in the form $a+bi$, where a and b are real numbers and i is the imaginary unit.

$a + bi \Rightarrow$ Combination of a real # and imaginary #

a: $\mathbb{R}$ $\quad$ bi: Imaginary

Ex: $4+2i$, $-3-8i$

Real #'s and Imaginary #'s are both considered to be Complex #s.

Real numbers: 2 is really $2+0i$

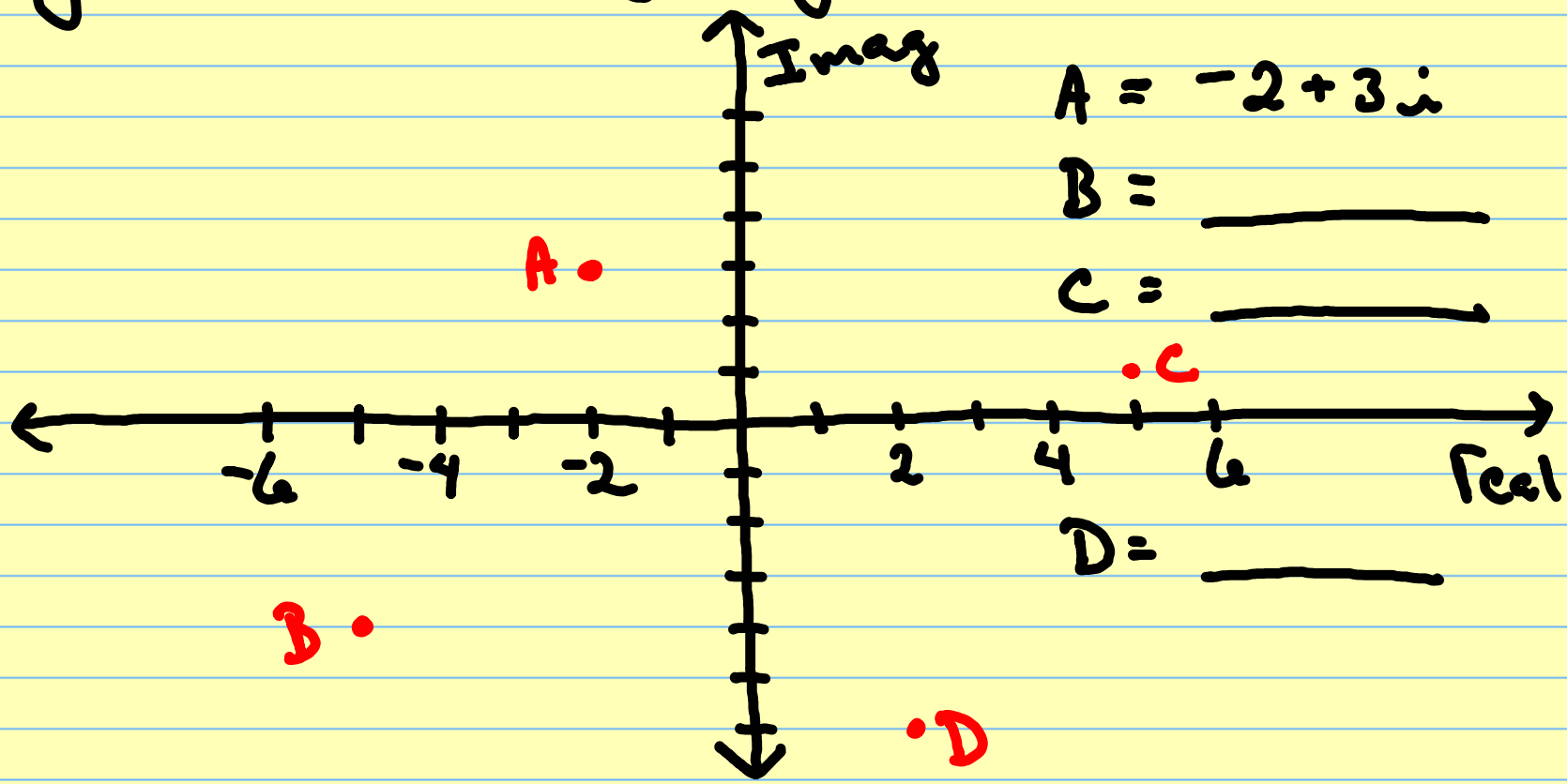
-8 is really $-8+0i$

Imaginary #s: $2i$ is really $0+2i$

$-\frac{1}{5}i$ is really $0-\frac{1}{5}i$

Complex Plane

X-axis ⇒ Real axis
y-axis ⇒ Imaginary axis



A = −2 + 3i

B = _____

C = _____

D = _____

20.3: (+) / (-) of Complex #'s

☆ "i" behaves as any other variable:

$2x + 3x = 5x$ so $2i + 3i = 5i$

$2x \cdot 3x = 6x^2$ so $2i \cdot 3i = 6i^2$

Process: (+) / (-) Complex #s

- Combine like terms

  real ± real , Im. ± Im

- Express result in simplest a + bi form

★ $(a+bi)+(c+di)$

$= (a+c)+(b+d)i$

Ex: Express the sum of $2+\sqrt{-9}$ and $-5+\sqrt{-4}$ in simplest $a+bi$ form

Homework: Pg 931: 1-25 odd

19. Express the difference $(5 - \sqrt{-50}) - (-2 + \sqrt{-162})$ in the form $a + bi$.